

Mathematics
July / Aug 2012

Name :

Class :

$1\frac{3}{4}$ hours



JABATAN PELAJARAN NEGERI TERENGGANU
PEPERIKSAAN PERCUBAAN
PENILAIAN MENENGAH RENDAH 2012

MATHEMATICS

Paper 2

One Hour Forty-Five Minutes

**DO NOT OPEN THIS TEST PAPER
UNTIL YOU ARE TOLD TO DO SO**

INFORMATION FOR CANDIDATES

1. This question paper consists of 20 questions.
2. Answer *all* questions.
3. Write your answer clearly in the spaces provided in the question paper.
4. Show your working. It may help you to get marks.
5. If you wish to change your answer, neatly cross out the answer that you have done. Then write down the new answer.
6. The diagram in the questions provided are not drawn to scale unless stated.
7. The marks allocated for each question are shown in brackets.
8. A list of formulae is provided on page 2.
9. The usage of calculator is *not* allowed.

| Examiner's Code | | |
|-----------------|------------|-------|
| Question | Full Marks | Score |
| 1 | 2 | |
| 2 | 2 | |
| 3 | 3 | |
| 4 | 3 | |
| 5 | 3 | |
| 6 | 3 | |
| 7 | 3 | |
| 8 | 4 | |
| 9 | 3 | |
| 10 | 3 | |
| 11 | 2 | |
| 12 | 3 | |
| 13 | 2 | |
| 14 | 3 | |
| 15 | 2 | |
| 16 | 3 | |
| 17 | 2 | |
| 18 | 5 | |
| 19 | 5 | |
| 20 | 4 | |
| Total | | |

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MPSM Negeri Terengganu

Dibiayai oleh:
Kerajaan Negeri Terengganu

TERENGGANU NEGERI ANJUNG ILMU

Dicetak Oleh:
Percetakan Yayasan Islam Terengganu Sdn. Bhd.
Tel: 609-666 8611/6652/8601 Faks: 609-666 0611/0063

This question paper consists 21 printed pages.

MATHEMATICS FORMULAE

The following formulae may be helpful in answering the questions. The symbols given are the ones commonly used.

RELATIONS

1. $a^m \times a^n = a^{m+n}$

2. $a^m \div a^n = a^{m-n}$

3. $(a^m)^n = a^{mn}$

4. Distance = $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$

5. Midpoint

$$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

6. Average speed = $\frac{\text{distance travelled}}{\text{time taken}}$

7. Mean = $\frac{\text{sum of data}}{\text{number of data}}$

8. Pythagoras Theorem
 $c^2 = a^2 + b^2$

SHAPE AND SPACE

1. Area of rectangle = length x width

2. Area of triangle = $\frac{1}{2}$ x base x height

3. Area of parallelogram = base x height

4. Area of trapezium
= $\frac{1}{2}$ x (sum of parallel sides) x height

5. Circumference of circle = $\pi d = 2\pi r$

6. Area of circle = πr^2

7. Curved surface area of cylinder
= $2\pi rh$

8. Surface area of sphere = $4\pi r^2$

9. Volume of right prism
= cross sectional area x length

10. Volume of cuboid
= length x width x height

11. Volume of cylinder = $\pi r^2 h$

12. Volume of cone = $\frac{1}{3} \pi r^2 h$

13. Volume of sphere = $\frac{4}{3} \pi r^3$

14. Volume of pyramid
= $\frac{1}{3}$ x base area x height

15. Sum of interior angles of polygon
= $(n - 2) \times 180^\circ$

16. $\frac{\text{arc length}}{\text{circumference of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$

17. $\frac{\text{area of sector}}{\text{area of circle}} = \frac{\text{angle subtended at centre}}{360^\circ}$

18. Scale factor, $k = \frac{P'A'}{PA}$

19. Area of image = k^2 x area of object

RUMUS MATEMATIK

Rumus-rumus berikut boleh membantu anda menjawab soalan. Simbol-simbol yang diberi adalah yang biasa digunakan.

PERKAITAN

$$1. a^m \times a^n = a^{m+n}$$

$$2. a^m \div a^n = a^{m-n}$$

$$3. (a^m)^n = a^{mn}$$

$$4. \text{ Jarak} = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$5. \text{ Titik Tengah}$$

$$(x, y) = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$6. \text{ Purata laju} = \frac{\text{jarak yang dilalui}}{\text{masa yang diambil}}$$

$$7. \text{ Min} = \frac{\text{hasil tambah nilai data}}{\text{bilangan data}}$$

$$8. \text{ Teorem Pithagoras}$$

$$c^2 = a^2 + b^2$$

BENTUK DAN RUANG

$$1. \text{ Luas segiempat tepat} = \text{panjang} \times \text{lebar}$$

$$2. \text{ Luas segitiga} = \frac{1}{2} \times \text{tapak} \times \text{tinggi}$$

$$3. \text{ Luas segiempat selari} = \text{tapak} \times \text{tinggi}$$

$$4. \text{ Luas trapezium}$$

$$= \frac{1}{2} \times (\text{hasil tambah dua sisi selari}) \times \text{tinggi}$$

$$5. \text{ Lilitan bulatan} = \pi d = 2\pi r$$

$$6. \text{ Luas Bulatan} = \pi r^2$$

$$7. \text{ Luas permukaan melengkung silinder}$$

$$= 2\pi r t$$

$$8. \text{ Luas permukaan sfera} = 4\pi r^2$$

$$9. \text{ Isipadu prisma tegak}$$

$$= \text{luas keratan rentas} \times \text{panjang}$$

$$10. \text{ Isipadu kuboid} = \text{panjang} \times \text{lebar} \times \text{tinggi}$$

$$11. \text{ Isipadu silinder} = \pi r^2 t$$

$$12. \text{ Isipadu kon} = \frac{1}{3} \pi r^2 t$$

$$13. \text{ Isipadu sfera} = \frac{4}{3} \pi r^3$$

$$14. \text{ Isipadu peramid tegak}$$

$$= \frac{1}{3} \times \text{luas tapak} \times \text{tinggi}$$

$$15. \text{ Hasil tambah sudut pedalaman poligon}$$

$$= (n - 2) \times 180^\circ$$

$$16. \frac{\text{panjang lengkok}}{\text{lilitan bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$17. \frac{\text{luas sektor}}{\text{luas bulatan}} = \frac{\text{sudut pusat}}{360^\circ}$$

$$18. \text{ Faktor skala, } k = \frac{P'A'}{PA}$$

$$19. \text{ Luas Imej} = k^2 \times \text{luas objek}$$

For
Examiner's
Use

Answer all questions.

- 1 Calculate the value of :
Hitung nilai bagi :

$$15 - 2(8 + 3)$$

Answer / *Jawapan:*

[2 marks]

| |
|---|
| 1 |
| 2 |

- 2 Calculate the value of $\frac{7}{10} \div \left(2\frac{1}{4} + \frac{2}{3}\right)$ and express the answer as a fraction in its lowest term.

Hitung nilai bagi $\frac{7}{10} \div \left(2\frac{1}{4} + \frac{2}{3}\right)$ dan ungkapkan jawapannya sebagai satu pecahan dalam sebutan terendah.

[2 marks]

Answer / *Jawapan:*

| |
|---|
| 2 |
| 2 |

- 3 (a) Find the value of :
Cari nilai bagi :

$$\sqrt[3]{-125}$$

- (b) Calculate the value of :
Hitung nilai bagi :

$$16 \div \left(\frac{2}{3}\right)^2$$

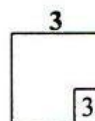
Answer / *Jawapan:*

[3 marks]

(a)

(b)

For
Examiner's
Use



- 4 Solve each of the following linear equations:
Selesaikan tiap-tiap persamaan linear berikut:

(a) $-4 + k = 10$

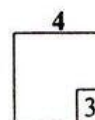
(b) $p - 6 = \frac{5p}{3}$

Answer / *Jawapan:*

[3 marks]

(a)

(b)



For
Examiner's
Use

5

Diagram 1 in the answer space shows a right angled triangle, PQR drawn on a grid of equal squares with sides 1 unit.

Rajah 1 di ruang jawapan menunjukkan sebuah segi tiga bersudut tegak, PQR yang dilukis pada grid segi empat sama bersisi 1 unit.

On Diagram 1,

Pada Rajah 1,

- (a) Draw the image of PQR under an enlargement at centre C with scale factor 2.
Lukis imej bagi PQR di bawah pembesaran pada pusat C dengan faktor skala 2.
- (b) State the coordinate of R' .
Nyatakan koordinat R' .

[3 marks]

Answer / Jawapan:

(a)

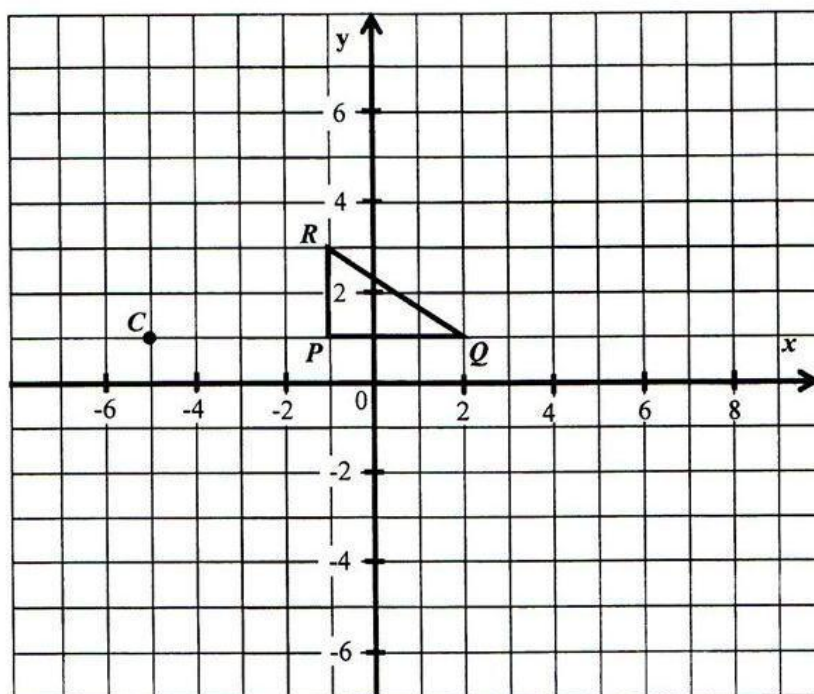


Diagram 1

(b) _____

5



- 6 Diagram 2 shows two polygons, Q and Q' , drawn on a grid of equal squares with sides of 1 unit.
Rajah 2 menunjukkan dua poligon, Q dan Q' , yang dilukis pada grid segi empat sama yang sama besar bersisi 1 unit.

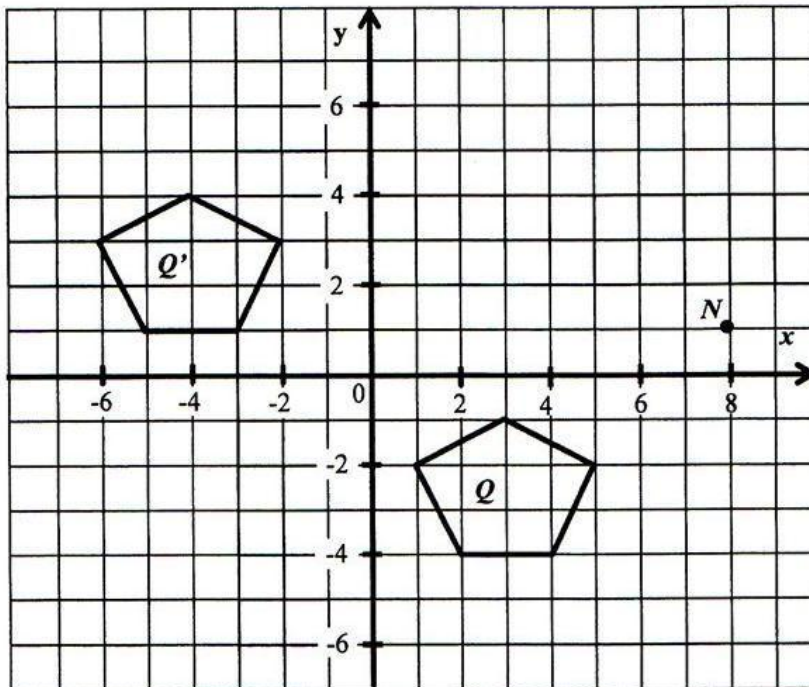


Diagram 2

- (a) Q' is the image of Q under transformation M .
Describe in full transformation M .
 Q' ialah imej bagi Q di bawah penjelmaan M .
Huraikan selengkapnya penjelmaan M .
- (b) State the coordinates of N under the same transformation.
Nyatakan koordinat bagi titik N di bawah penjelmaan yang sama.

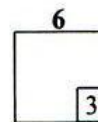
[3 marks]

Answer / Jawapan:

(a)

(b)

For
Examiner's
Use



For
Examiner's
Use

7

In Diagram 3, PQR and RST are right angled triangles. PSR is a straight line.
Dalam Rajah 3, PQR dan RST ialah segi tiga bersudut tegak. PSR ialah garis lurus.

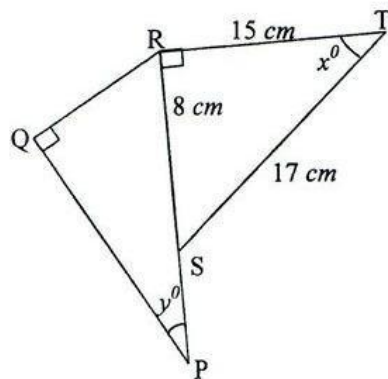


Diagram 3

It is given that $\tan y^\circ = \frac{5}{12}$

Diberi bahawa $\tan y^\circ = \frac{5}{12}$,

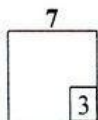
- Find the value of $\sin x^\circ$
Cari nilai bagi $\sin x^\circ$
- Calculate the length, in cm, of PS .
Hitung panjang, dalam cm, bagi PS .

[3 marks]

Answer / Jawapan:

(a)

(b)



- 8 Table 1 shows the number of outpatients at a government clinic in a week.
Jadual 1 menunjukkan bilangan pesakit luar di sebuah klinik kerajaan dalam seminggu.

| Days <i>Hari</i> | Sunday <i>Ahad</i> | Monday <i>Isnin</i> | Tuesday <i>Selasa</i> | Wednesday <i>Rabu</i> | Thursday <i>Khamis</i> |
|------------------------------------------------------|-----------------------|------------------------|--------------------------|--------------------------|---------------------------|
| Number of Patients <i>Bilangan Pesakit</i> | 300 | 250 | 450 | 400 | 500 |

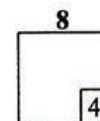
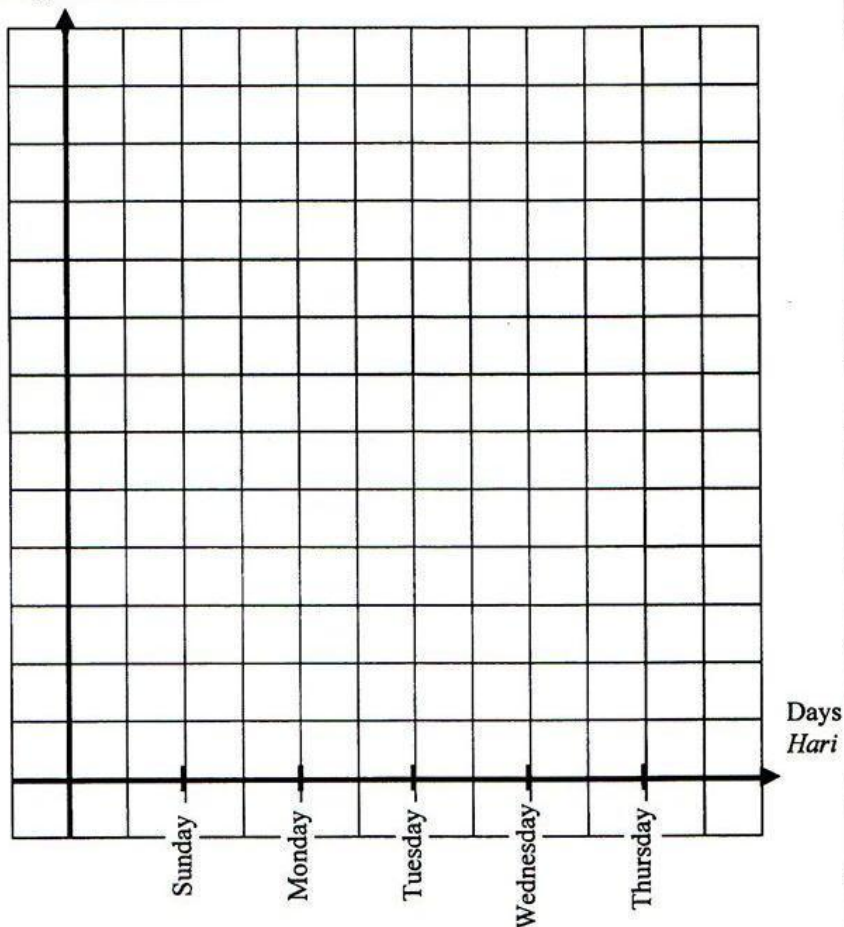
Table 1

On diagram in the answer space, draw a line graph to represent the data.
Pada rajah di ruang jawapan, lukis sebuah graf garis untuk mewakili data tersebut.

Answer / *Jawapan:*

[4 marks]

Number of Outpatients
Bilangan Pesakit Luar



For
 Examiner's
 Use

For
Examiner's
Use

9

Table 2 shows the number of computers donated by three companies to Sekolah Menengah Bukit Tinggi.

Jadual 2 menunjukkan bilangan komputer yang disumbangkan oleh tiga buah syarikat kepada Sekolah Menengah Bukit Tinggi.

| Company Syarikat | Number of Computer Bilangan Komputer |
|---------------------|-----------------------------------------|
| A | 20 |
| B | 30 |
| C | 20 |

Table 2

The information of computers donated by Company C is shown fully in the pictograph in the answer space.

Complete the pictograph to represent all the information in Table 2.



Maklumat bagi komputer yang disumbangkan oleh Syarikat C ditunjukkan sepenuhnya dalam piktograf di ruang jawapan.

Lengkapkan piktograf itu untuk mewakili semua maklumat dalam Jadual 2.

[3 marks]

Answer / Jawapan:

Number of computers donated
Bilangan Komputer yang disumbangkan

| | |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Company A | |
| Company B | |
| Company C |   |



Represents Computers
Mewakili Komputer

9
3

- 10 Factorise completely each of the following expressions:
Faktorkan selengkapnya tiap-tiap ungkapan berikut:

(a) $pq + p^2r$

(b) $2x^2 + 4xy - 3xz - 6yz$

[3 marks]

Answer / Jawapan:

(a)

(b)

*For
Examiner's
Use*

10

| |
|---|
| |
| 3 |

- 11 Expand $(3p - 2q)(3p + 2q)$
Kembangkan

[2 marks]

Answer / Jawapan:

11

| |
|---|
| |
| 2 |

For
Examiner's
Use

- 12 Express $\frac{7p}{12} - \frac{p-6}{4}$ as a single fraction in its simplest form.

Ungkapkan $\frac{7p}{12} - \frac{p-6}{4}$ sebagai pecahan tunggal dalam bentuk termudah.

[3 marks]

Answer / Jawapan:

12

3

- 13 Given $Lk = 2c + L$, express L in terms of c and k .
Diberi $Lk = 2c + L$, ungkapkan L dalam sebutan c dan k .

Answer / Jawapan:

[2 marks]

13

2

For
Examiner's
Use

Solve the following inequalities :

Selesaikan ketaksamaan berikut :

(a) $5 + p < 12$

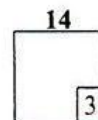
(b) $5h - 7 \geq 8 + 2h$

[3 marks]

Answer / Jawapan:

(a)

(b)



For
Examiner's
Use

- 15 Find the value of :
Cari nilai bagi :

$$5^{f+3} = (5)(5^{3f})$$

[2 marks]

Answer / Jawapan:

15

| |
|---|
| |
| 2 |

- 16 Evaluate
Nilaikan

$$10 \times 2^{-3} \times 64^{\frac{2}{3}}$$

[3 marks]

Answer / Jawapan:

16

| |
|---|
| |
| 3 |

- 17 Diagram 4 shows a polygon M drawn on a grid of equal squares with sides of 1 unit.
Rajah 4 menunjukkan sebuah poligon M yang dilukis pada grid segi empat sama bersisi 1 unit.

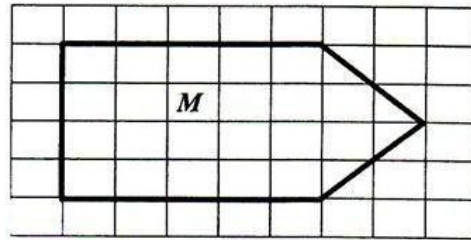


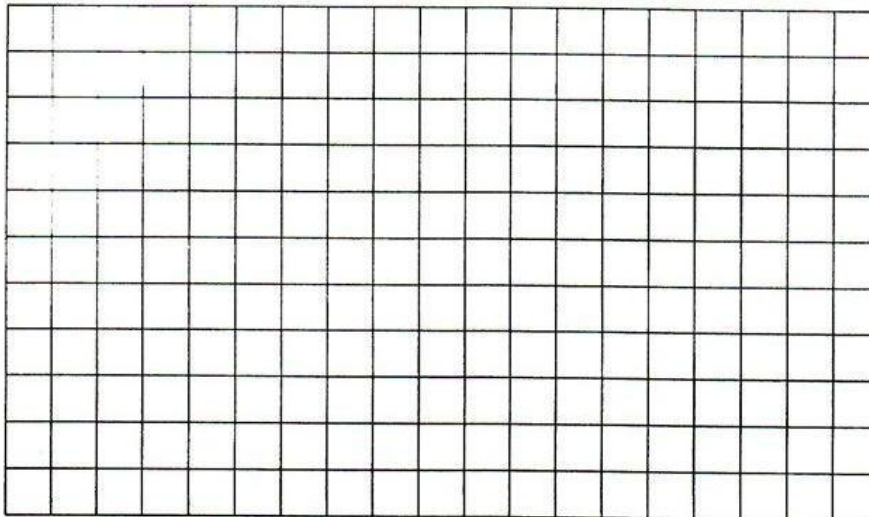
Diagram 4

On the grid in the answer space, redraw polygon M using the scale $1 : \frac{1}{2}$

Pada grid di ruang jawapan, lukis semula poligon M dengan menggunakan skala $1 : \frac{1}{2}$

Answer *Jawapan:*

[2 marks]



For
Examiner's
Use

17



For
Examiner's
Use

18

Diagram 5 in the answer space shows a regular polygon, $PQRSTU$.
 W , X and Y are three moving points inside the polygon, $PQRSTU$.

*Rajah 5 di ruang jawapan menunjukkan sebuah polygon sekata, $PQRSTU$.
 W , X dan Y adalah tiga titik yang bergerak di dalam poligon, $PQRSTU$.*

- (a) W is the point which moves such that it is constantly 2 cm from point O .
Describe fully the locus of W .

W ialah titik yang bergerak dengan keadaan titik itu sentiasa 2 cm dari titik O .

Huraikan selengkapnya lokus bagi W .

- (b) On Diagram 5, draw
Pada Rajah 5, lukis

- (i) the locus of the point X which moves such that its distance is always constant from the lines PQ and TS .

lokus bagi titik X yang bergerak dengan keadaan titik itu sentiasa berjarak tetap dari garis PQ dan TS .

- (ii) the locus of the point Y which moves such that it is equidistant from the point P and the point S .

lokus bagi titik Y yang bergerak dengan keadaan jaraknya adalah sama dari titik P dan titik S .

- (c) Hence, mark with the symbol \otimes the intersection of the locus of X and the locus of Y .

Seterusnya, tandakan \otimes kedudukan bagi persilangan lokus X dan lokus Y .

[5 marks]

Answer / Jawapan:

(a)

(b) (i), (ii)

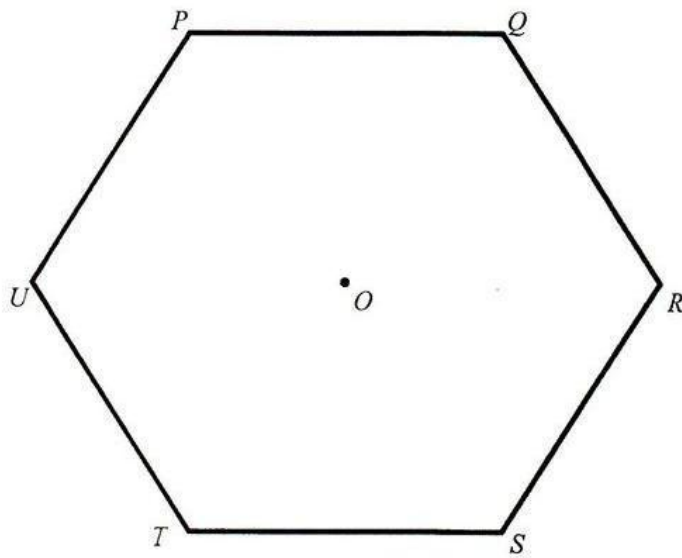


Diagram 5

For
Examiner's
Use

18



For
Examiner's Use 19

Diagram 6.1 shows a triangle STU drawn not to scale.

Rajah 6.1 menunjukkan sebuah segi tiga STU yang dilukis tidak mengikut skala.

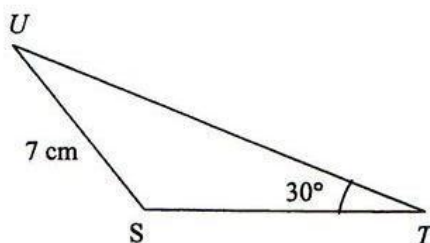


Diagram 6.1

Diagram 6.2 in the answer space shows a straight line ST .

Rajah 6.2 dalam ruang jawapan menunjukkan garis lurus ST .

Using only a ruler and a pair of compasses, construct
Menggunakan pembaris dan jangka lukis sahaja, bina

- (i) triangle STU to the measurements shown in Diagram 6.1,
segi tiga STU menggunakan ukuran seperti yang ditunjukkan dalam
Rajah 6.1,
- (ii) the perpendicular line to the straight line TU which passes through the
point S .
garis serenjang kepada garis lurus TU yang melalui titik S .

[5 marks]

Answer / Jawapan:

(i), (ii)

For
Examiner's
Use



Diagram 6.2

19



For
Examiner's
Use

20

Use the graph paper on page 21 to answer this question.

Gunakan kertas graf yang disediakan di halaman 21 untuk menjawab soalan ini.

Table 3 shows the values of two variables, x and y , of a function.

Jadual 3 menunjukkan nilai-nilai pembolehubah, x dan y , bagi suatu fungsi.

| | | | | | | | |
|-----|----|----|----|---|---|----|-----|
| x | -3 | -2 | -1 | 0 | 1 | 2 | 3 |
| y | 0 | 8 | 10 | 8 | 2 | -6 | -18 |

Table 3

The x -axis and the y -axis are provided on the graph paper on page 21.

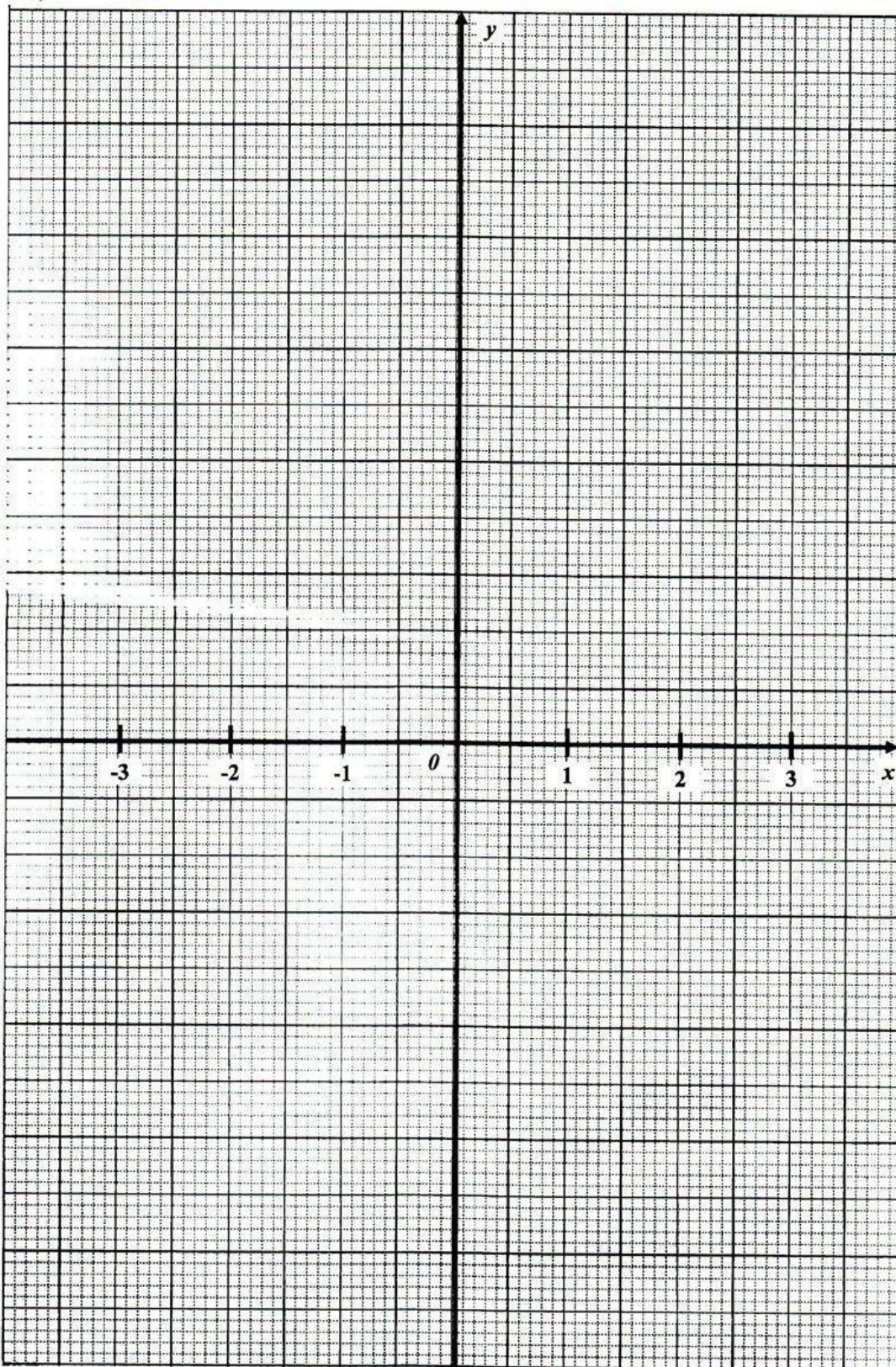
Paksi- x dan paksi- y telah disediakan pada kertas graf di halaman 21.

- (a) Using the scale of 2 cm to 4 units, complete and label the y -axis.
Menggunakan skala 2 cm kepada 4 unit, lengkap dan labelkan paksi- y .
- (b) Based on Table 3, plot all the points on the graph paper.
Berdasarkan Jadual 3, plot semua titik pada kertas graf itu.
- (c) Hence, draw the graph of function.
Seterusnya, lukis graf fungsi itu.

[4 marks]

Graph for Question 20
Graf untuk Soalan 20

For
Examiner's
Use



20
4

END OF QUESTION PAPER
KERTAS SOALAN TAMAT